# SYRIAN ARAB REPUBLIC

## MINISTRY OF ELECTRICITY

## Public Establishment for Electricity Generation

# Technical Statistical Report

# 2015

Public Establishment for Electricity Generation - 17 April Street - Opposite Carlton Hotel- Website: www.peeg.gov.syb

# Introduction

Electricity is considered an essential factorfor modern life . Power plants and transmission and distribution networks are important understructure areas for countries and people , because electricity poweris the prompting energy for countries and their development in all important work fields such as industry , agriculture , commerce , transport and domestic services .

The continuous increasing in population and the depending of humans on electricity in their daily life became a big economical burden on the economy of countries regarding construction of generation stations of electrical power and transmission and distribution networks connected with it.

In addition to its environmental effects which force countries to do researches and studies for planning, organizing and producing the electrical power and rationalization its consumption by means of its working institutions in this field.

Starting of achievement the lasting development,

Ministry of electricity by means of its establishments aims to increase the contribution of renewal powers in the Syrian Power Balance, in order to raise the qualification of using the electrical power in all fields, which reduces the intense demand for buried fuel to produce electricity.

# ***Ministry of Electricity***

Caused by the Legislative Decree no. 94 date 23/09/1974.

Duties related to the electricity sector, which were practiced by Ministry of Oil, were transferred to the Ministry of Electricity.

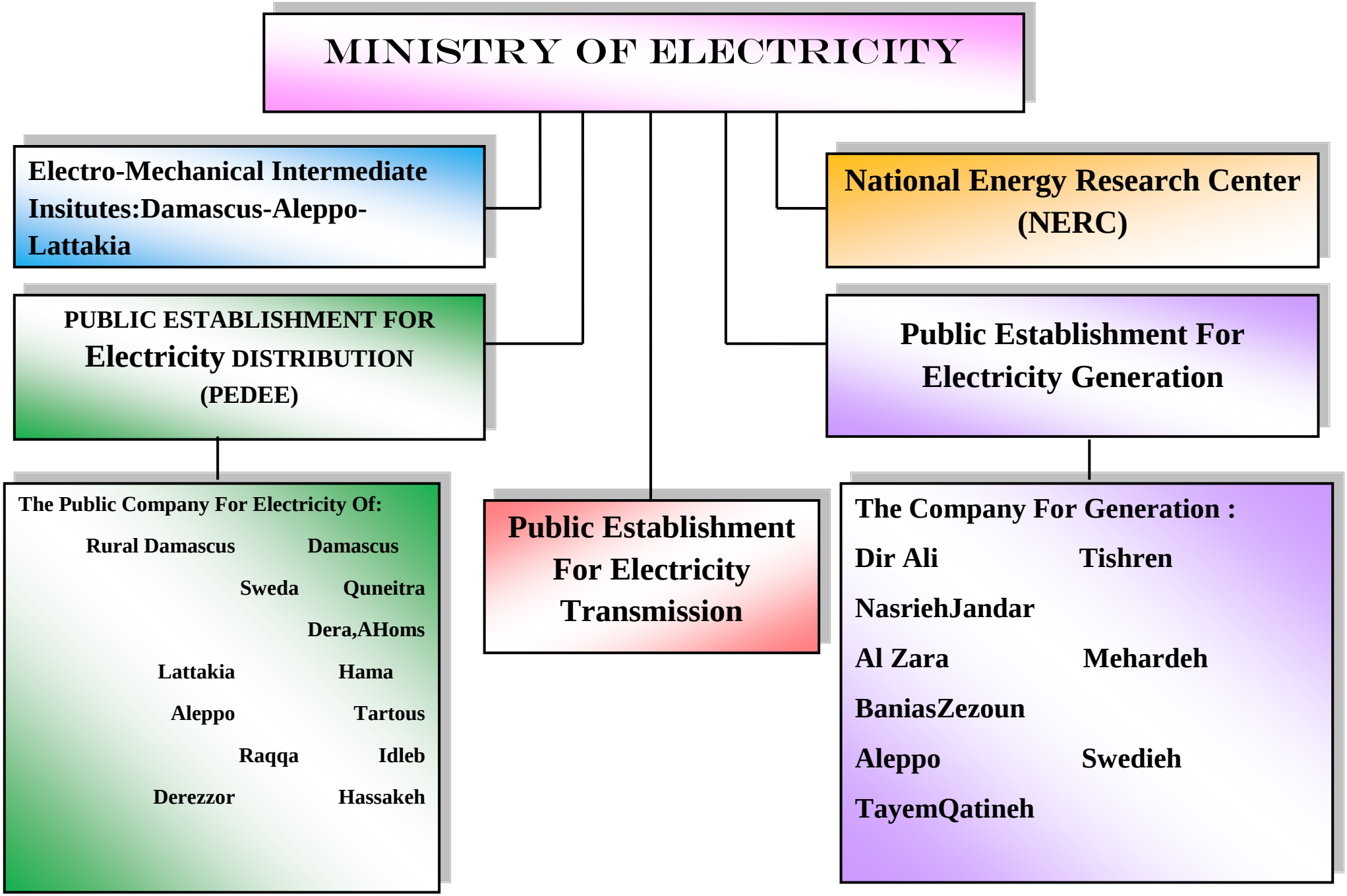
Ministry of Electricity does directly or by means of the institutions and companies related to it, or in cooperation with other institutions, does all tasks and functions related to the electricity sector, specially:

a – Preparing the required plans to fulfill the state needs of the electrical energy and to carry out the current projects to attain this purpose.

b - Producing, transmission, distribution and investment of the electrical power and saving it to suit the overall economic, industrial and commercial development.

c –Circulating the lighting all over the countryside of the country.

d - Supervising the production of electricity in all the institutions, companies and public sector departments, which have major and auxiliary generating electricity, and issuing the particular instructions to operate and invest it to suit the public interest.

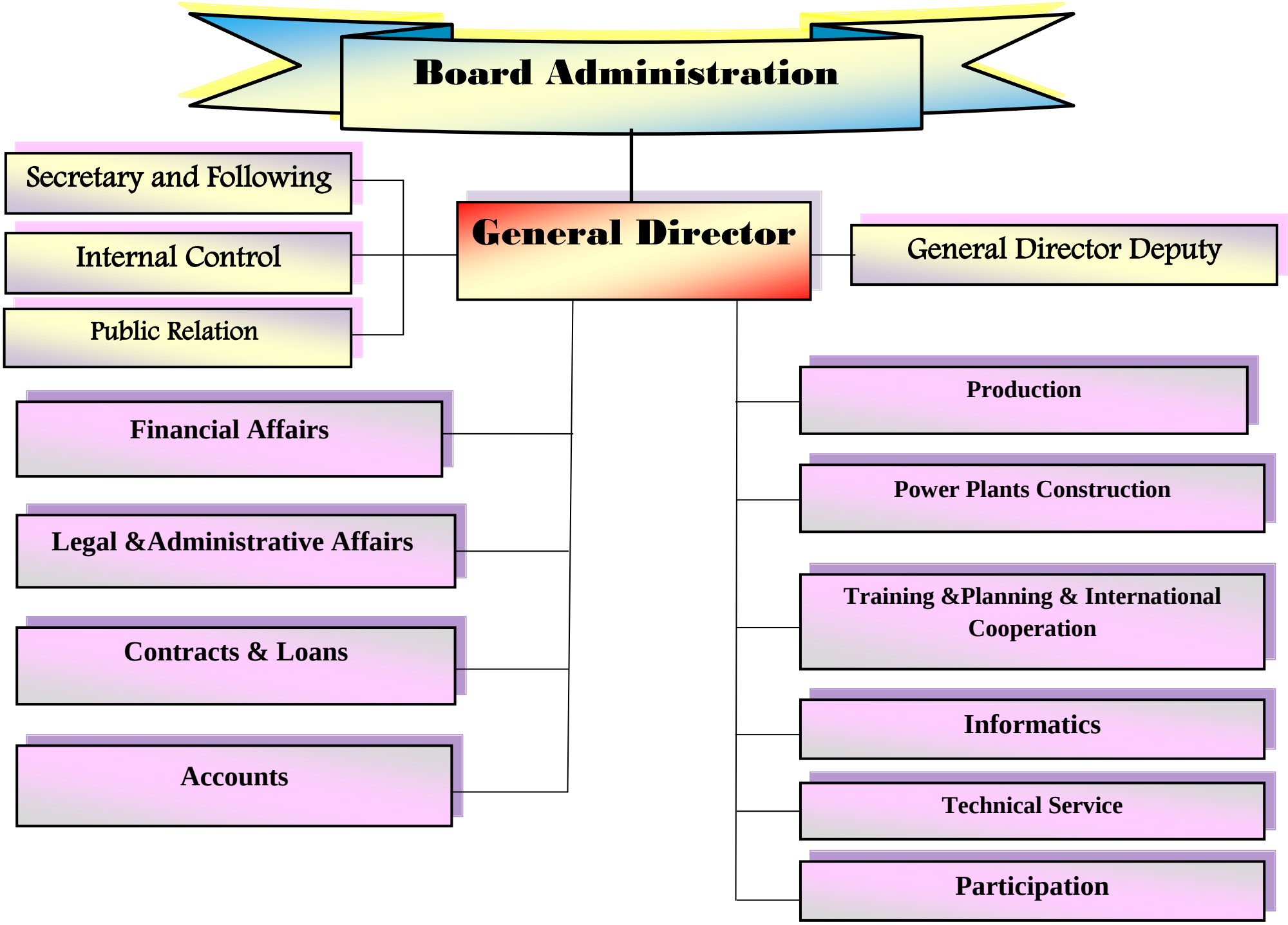

MINISTRY OF ELECTRICITY
Electro-Mechanical Intermediate Insitutes:Damascus-Aleppo-Lattakia
National Energy Research Center (NERC)
PUBLIC ESTABLISHMENT FOR Electricity DISTRIBUTION (PEDEE)
Public Establishment For Electricity Generation
The Public Company For Electricity Of:
Rural Damascus
Damascus
Sweda
Quneitra
Dera,AHoms
Lattakia
Hama
Aleppo
Tartous
Raqqa
Idleb
Derezzor
Hassakeh
Public Establishment For Electricity Transmission
The Company For Generation :
Dir Ali
Tishren
NasriehJandar
Al Zara
Mehardeh
BaniasZezoun
Aleppo
Swedieh
TayemQatineh

# Tasks of Public Establishment for Electricity Generation

After issuing the Law no 32 date 2012 and the Decree no 355 the Establishment has been concered with all the tasks related to the generating of electricity specially:

- Taking advantage of all electricity generating possibilities from primary energy sources in the country and putting it into practical practice when the economical utility is proved.
- Developing a strategy for using the available primary energy sources to generate electricity (public and private) with the highest possible efficiency, taking into consideration the principles of operative regulations related to the protection of environment and the sustainable development .
- Fulfilling the demand for electricity power by the optimal using for sources of primary new and renewal energies.
- Constructing generation power plants(steam , combined circuit, simple circuit, nuclear and renewal energies …etc.
- Specifying sites for the new power plants in coordination with the public establishment for electricity transmission.
- Advertising for offers demands for investors to manage or operate the current generation activities .
- Overseeing the operation of generation sets and controlling them in coordination with generation companies, foundations and the relevant public authorities.

- Making maintenance programs for generation sets and controlling them in coordination with the relevant public authorities.
- Helping and Overseeing to secure the necessary spare parts and bringing along experts to achieve the specific maintenance.
- Monitoring and improving the performance of generation sets and working on operating them with a high economical and technical efficiency.
- Putting the required plans to raise the yield to the international standard levels for similar generating electricity systems.
- Determining the prices of produced electrical energy in institutions and foundations connected with the public establishment for electricity transmission, based on the actual cost of production which allows fullfillng the operation expenses ,the maintenance and the executed expansions in generation plants, which are sold for others by means of the networks of the public establishment for electricity transmission, in exchange for fees determined according to the current investment regulations.
- Overseeing the reasons of the environmental  pollution and taking into consideration the execution of instructions, regulations and laws concerning the protection of it.

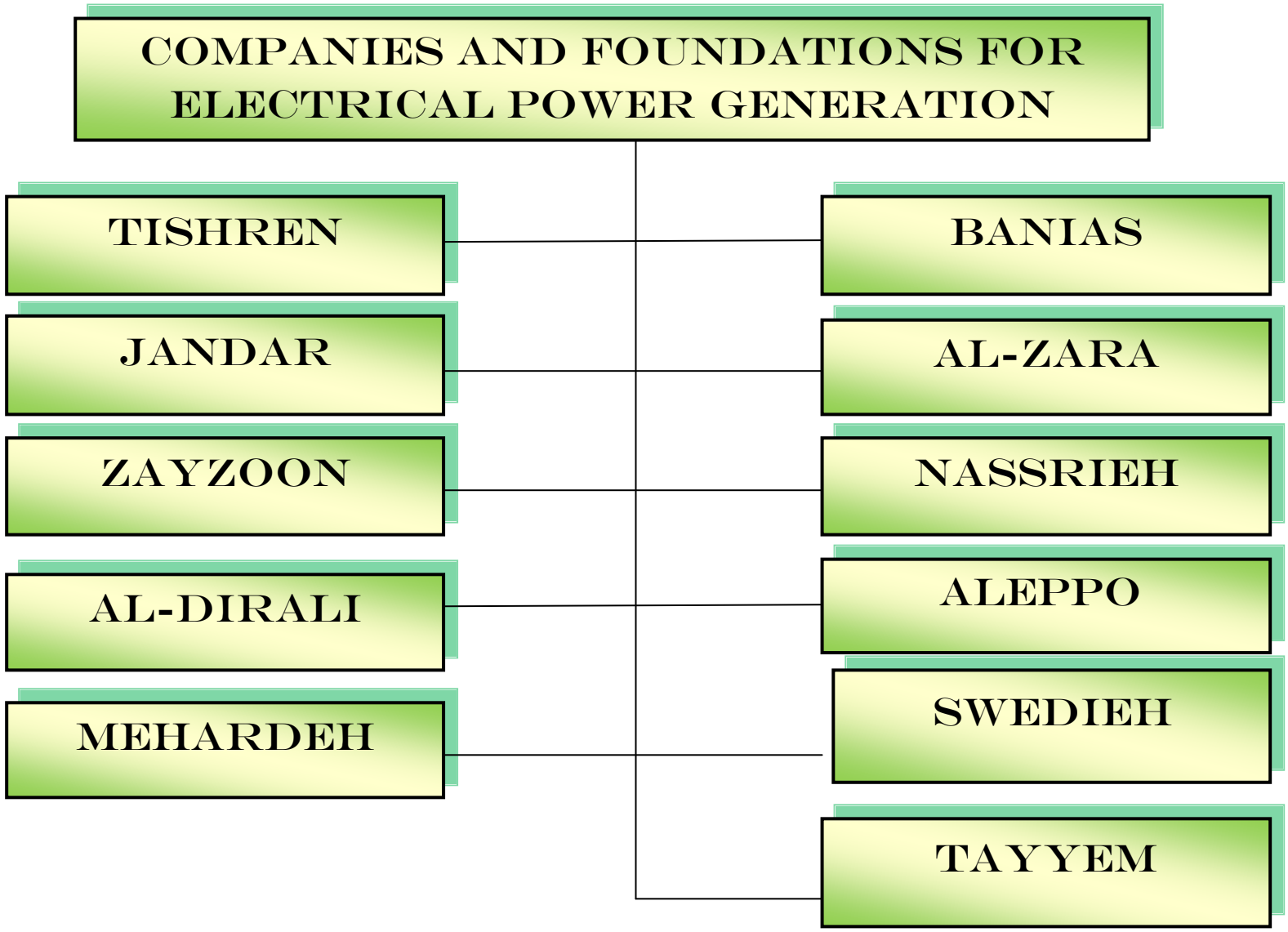

Board Administration
Secretary and Following
Internal Control
Public Relation
General Director
General Director Deputy
Financial Affairs
Legal &Administrative Affairs
Contracts & Loans
Accounts
Production
Power Plants Construction
Training &Planning & International Cooperation
Informatics
Technical Service
Participation

## Public Companies and establishments for Electrical Energy Generation:

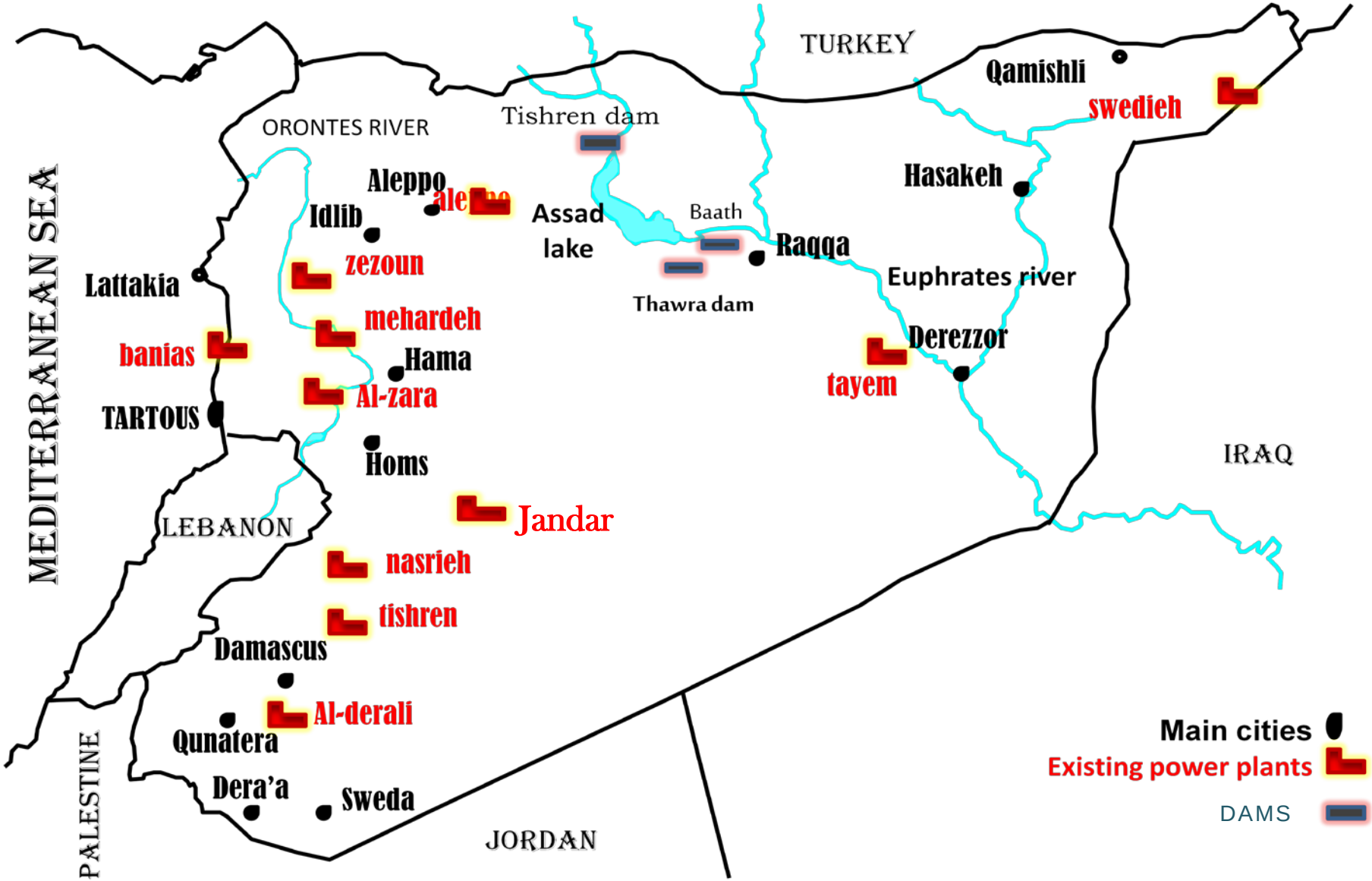
The Decree no/ 13/date/ 1994/ created five public companies (Quttaineh/ Mehardeh / Banias / Tishren / Jandar) and the public establishments (Swedieh and Tayem). In 2001 four companies were created (Nasrieh - Zezoun - Aleppo – al Zara). In (2011) the Public Company (Deir Ali) was also created.

The tasks of the previous companies were determined as following:

- Generating electrical power and delivering it to the Public Establishment for Electricity Generation and Transmission according to the economic standards and the regular technical conditions.
- Operation the foundations and their equipment according to the plans prepared by the ministry.
- Putting public and periodic maintenance programs for all foundations and their equipment according to the general programs prepared by the establishments.
- Preparing studies and suitable plans to develop the work of the public company and foundation according to the general plans prepared by the establishments.
- Execution all the tasks entrusted to it by the establishments.

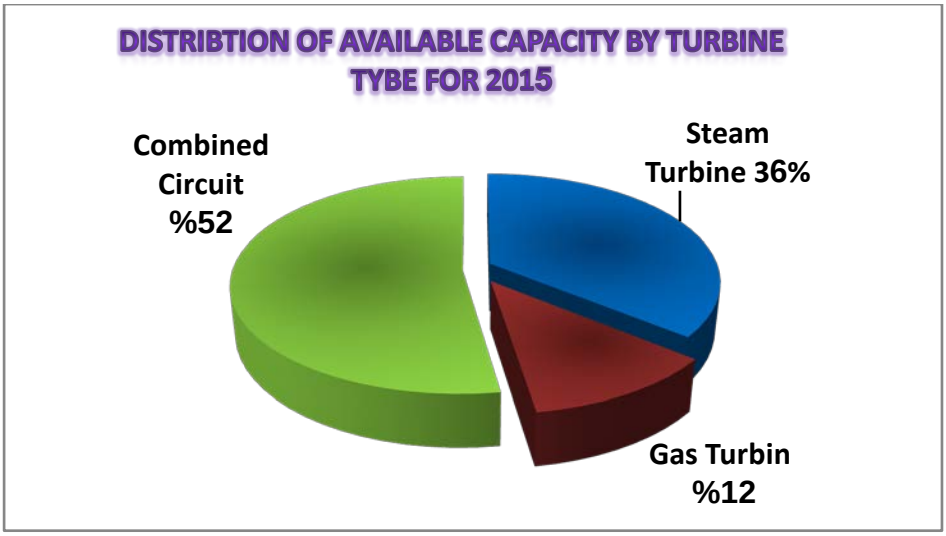

COMPANIES AND FOUNDATIONS FOR ELECTRICAL POWER GENERATION
TISHREN
JANDAR
ZAYZOON
AL-DIRALI
MEHARDEH
BANIAS
AL-ZARA
NASSRIEH
ALEPPO
SWEDIEH
TAYYEM

# MAIN POWER PLANTS IN THE SYRIA POWER SYSTEM FOR 2015



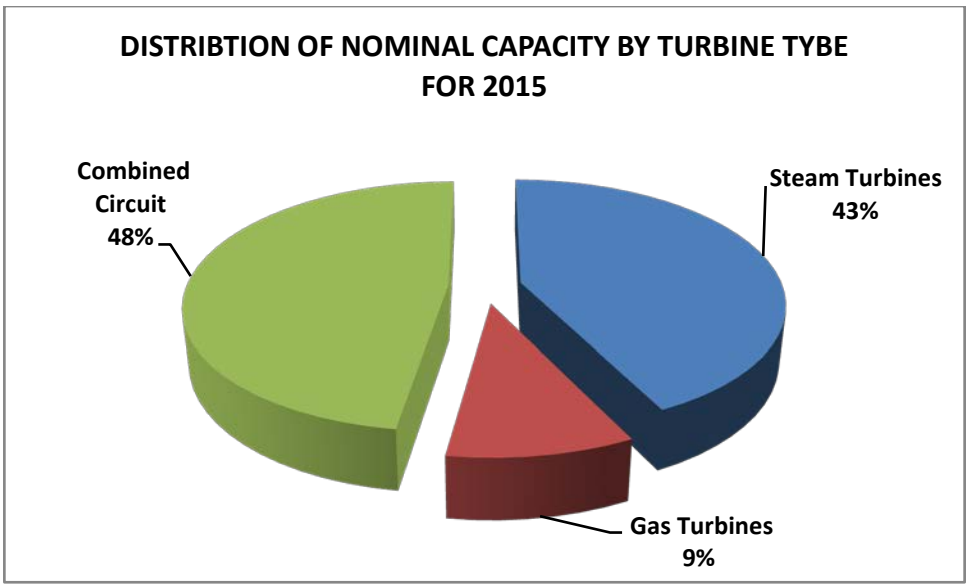
# Available Capacity2015

| | Total | Fuel Type | Commissioning Date |
|---|---|---|---|
| 1-Steam Turbines | 1880 | | |
| Mehardeh | 360 | HFO-NG | 1979-1988 |
| Banias | 550 | HFO | 1982-1987 |
| Tishren Thermal | 360 | HFO-NG | 1993-1994 |
| Aleppo | 0 | HFO-NG | 1997 |
| Al Zara | 610 | HFO-NG | 2000 |
| 2- Gas Turbines | 590 | | |
| Swedieh | 120 | NG | 1988-1989 |
| Tayem | 0 | NG | 1991 |
| Tishreen Gas | 200 | HFO-NG | 1995 |
| BaniasExtension | 270 | NG | 2010 |
| 3- Combined Circuit | 3120 | | |
| Jandar | 560 | NG | 1994-1995 |
| JandarExtension | 430 | NG | 2011 |
| Nasrieh | 450 | NG | 1995-2007 |
| Zezoun | 0 | NG | 1996-2007 |
| DeirAli | 750 | NG | 2008-2009 |
| TishreenExtension | 430 | NG | 2009 |
| DeirAli Extension | 500 | | 2013 |
| Grand Total | 5590 | | |
| 4- Diesel Oil | 84 | | |
| Mehardeh | 25 | DIESEL OIL | 1988 |
| Banias | 34 | DIESEL OIL | 1988 |
| Aleppo | 25 | DIESEL OIL | 1997 |



# NominalCapacity2015

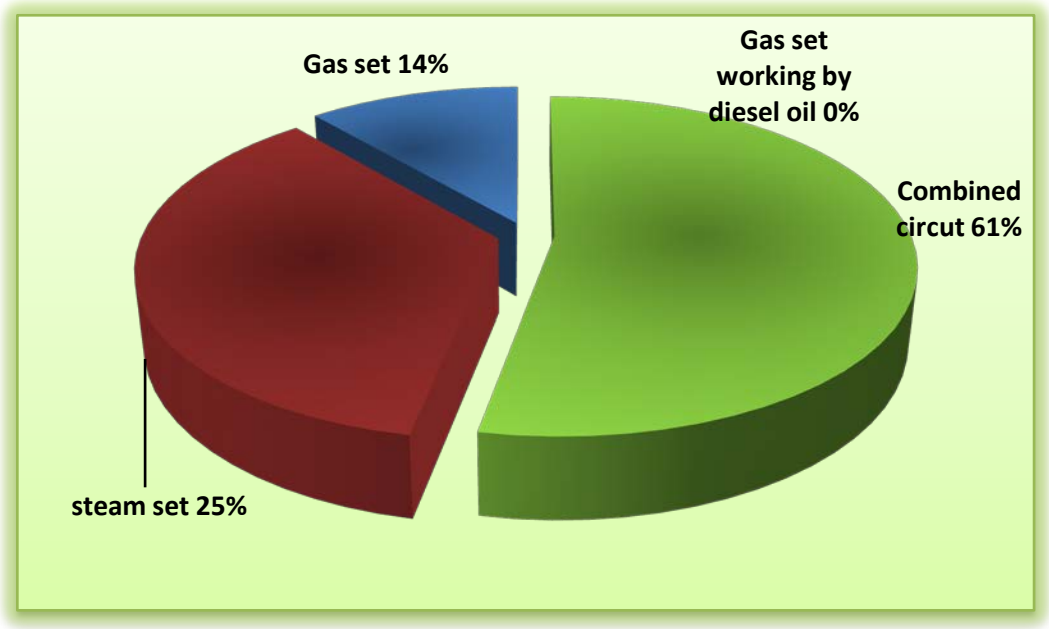
| | total | fuel type | commissioning date |
|---|---|---|---|
| 1-Steam Turbines | 3415 | | |
| Mehardeh | 620 | HFO-NG | 1979-1988 |
| Banias | 670 | HFO | 1982-1987 |
| Tishren thermal | 400 | HFO-NG | 1993-1994 |
| Aleppo | 1065 | HFO-NG | 1997 |
| Al zara | 660 | HFO-NG | 2000 |
| 2- Gas Turbines | 767 | | |
| Swedieh | 170 | NG | 1988-1989 |
| Tayem | 102 | NG | 1991 |
| Tishreen gas | 225 | HFO-NG | 1995 |
| BaniasExtension | 270 | NG | 2010 |
| 3- Turbines | 3812 | | |
| Jandar | 702 | NG | 1994-1995 |
| JandarExtension | 450 | NG | 2011 |
| Nasrieh | 487.5 | NG | 1995-2007 |
| Zezoun | 487.5 | NG | 1996-2007 |
| DeirAli | 750 | NG | 2008-2009 |
| TishreenExtension | 435 | NG | 2009 |
| Deir Ali Extension | 500 | | 2013 |
| Grand Total | 7994 | | |
| 4- Diesel Oil | 84 | | |
| Mehardeh | 25 | DO | 1988 |
| Banias | 34 | DO | 1988 |
| Aleppo | 25 | DO | 1997 |

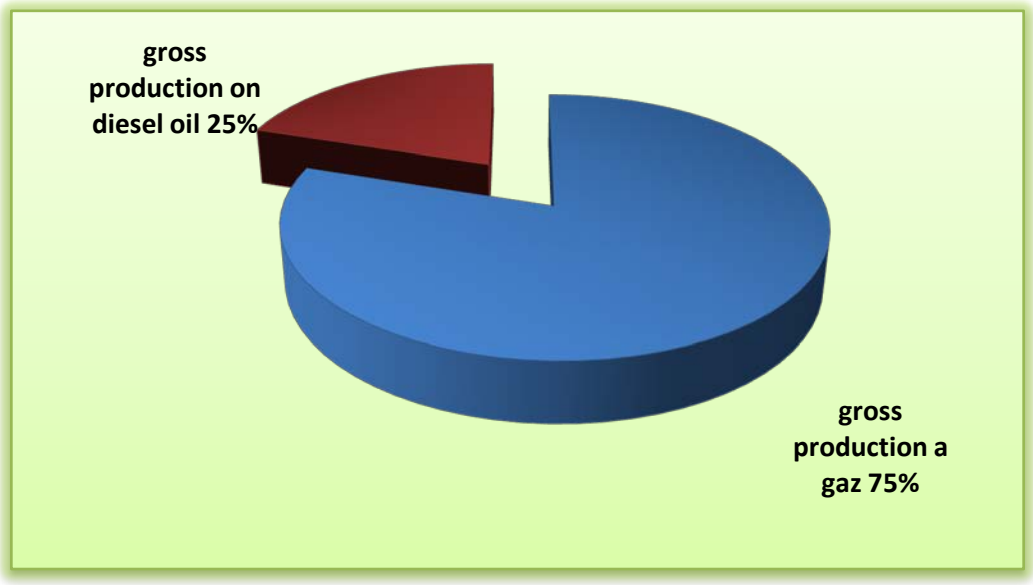


# Institution Production During2015

***Unit: Millionk.w***

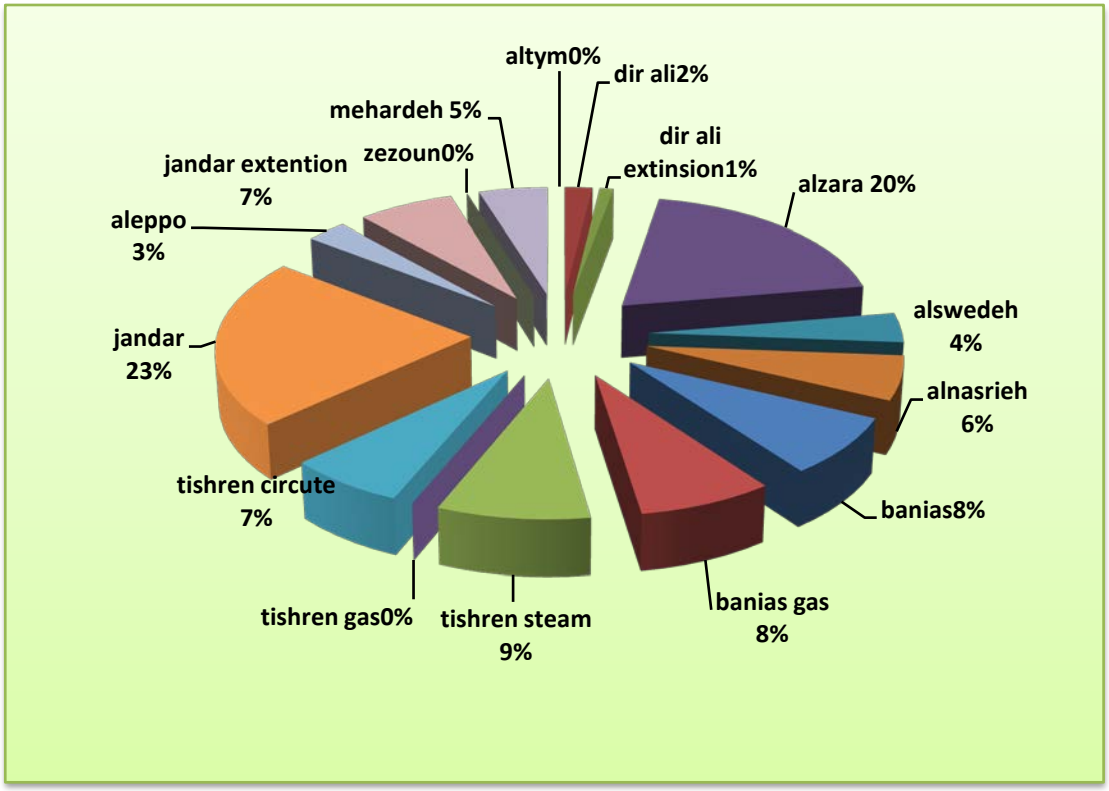
| Turbines Sort | Gas Grand Total | Diesel Oil Grand Total | Grand Total |
|---|---|---|---|
| Combined Circuit | 8560.376 | 0.6176 | 8560.994 |
| Steam Units | 3529.834 | 4706.486 | 2186.575 |
| Gas Units | 2186.575 | 0 | 2186.575 |
| Gas Units working by Diesel Oil | 0 | 0 | 0 |
| Grand Total | 14276.786 | 4707.104 | 18983.890 |

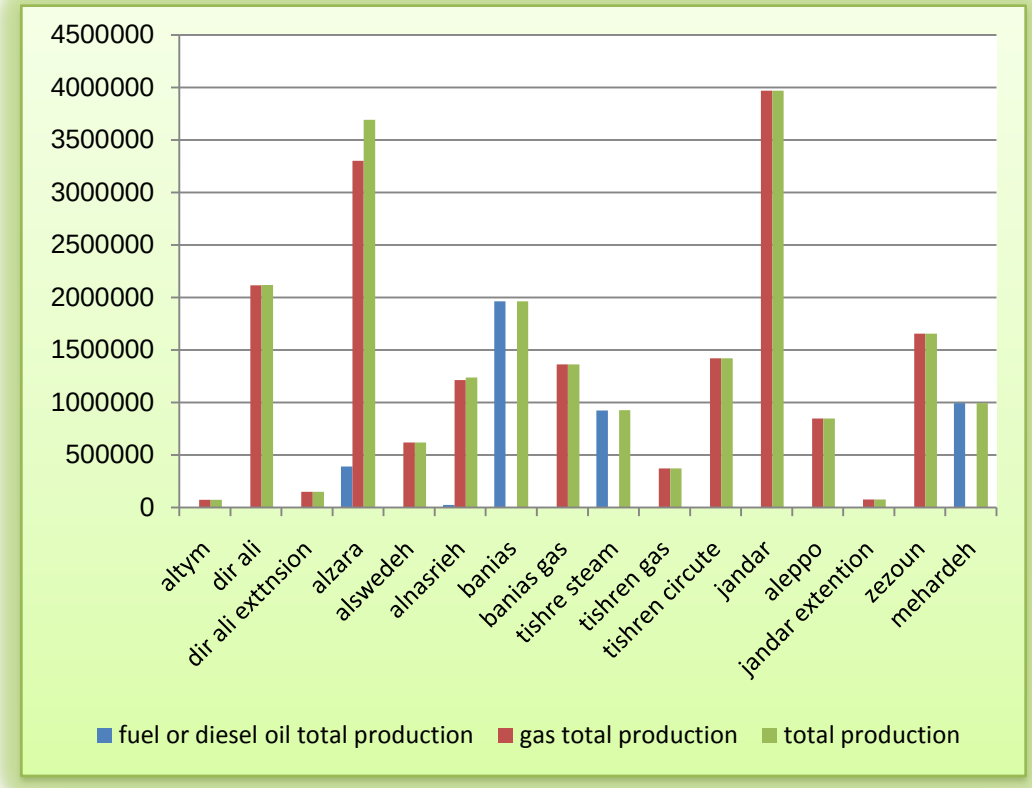


# Institution Production During 2015

## *Public Institution Production According To Generation Stations*



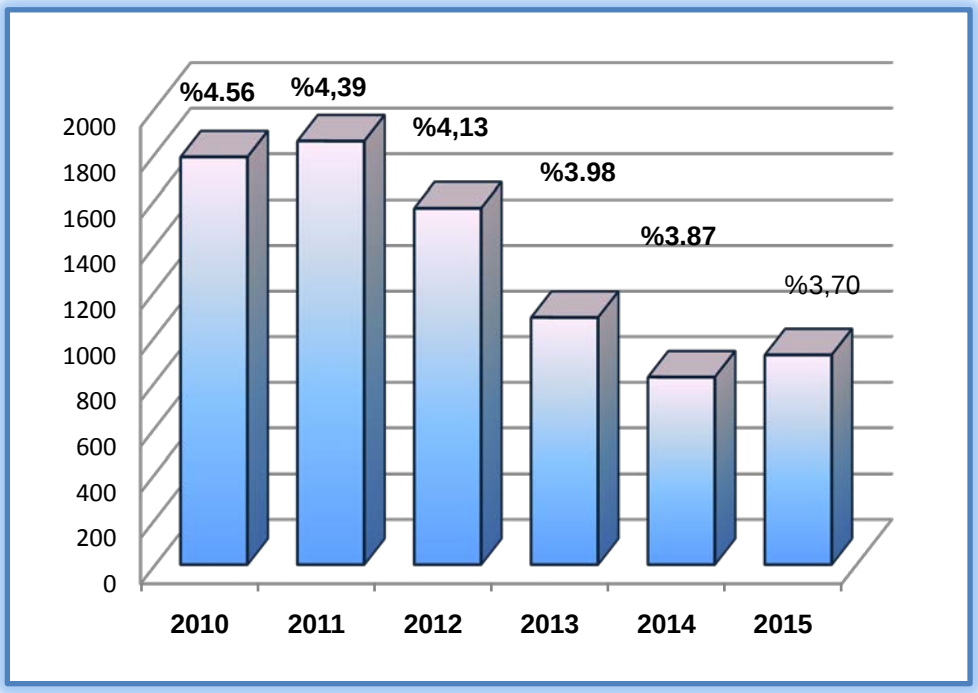



# Performance Indicators

## *Auxiliary Consumption Of The PEEG Power Plants (GWH)*

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | con/gen *100 |
|---|---|---|---|---|---|---|---|
| 1- Aleppo Power Plant | 475 | 475 | 371 | 167 | 8 | 43 | 11 |
| 2- Mehardeh Power Plant | 244 | 235 | 147 | 129 | 69 | 88 | 7 |
| 3- Banias Power Plant | 176 | 201 | 189 | 139 | 138 | 105 | 7 |
| 4- Banias Extension | 1 | 8 | 1.7 | 5 | 9 | 10 | 1 |
| 5- Al Zara Power Plant | 259 | 258 | 267 | 258 | 231 | 240 | 6 |
| 6- Tishreen Power Plant | | | | | | | |
| Steam Section | 190 | 180 | 156 | 53 | 85 | 164 | 9 |
| Gas Turbine Section (NG) | 9 | 9 | 6 | 3 | 3 | 3 | 1 |
| 7- Jandar Cc Power Plant | 105 | 113 | 115 | 95 | 96 | 108 | 2 |
| 8- Swedieh Power Plant | 34 | 37 | 15 | 14 | 31 | 30 | 5 |
| 9- Tayem Power Plant | 5 | 4 | 4.7 | 0.3 | 0.6 | 0.2 | 1 |
| 10- Dir Ali Power Plant | 98 | 99 | 84 | 85 | 51 | 22 | 2 |
| 11- Nasrieh Power Plant | 84 | 89 | 87 | 70 | 30 | 21 | 2 |
| 12- Zezoun Power Plant | 74 | 76 | 62 | 16 | 28 | 3 | 2 |
| 13- Tishren Extension | 29 | 69 | 46 | 41 | 25 | 39 | 2 |
| 14-Jandar Extension | | | 4 | 3 | 8 | 18 | 1 |
| 15- Dir Ali Extention | | | | 3 | 5 | 22 | 0 |
| Total Auxiliary Consumption | 1783 | 1853 | 1560 | 1081.3 | 819.6 | 917 | %4 |

**Auxiliary Consumption in Generation Stations Relating to The Total**



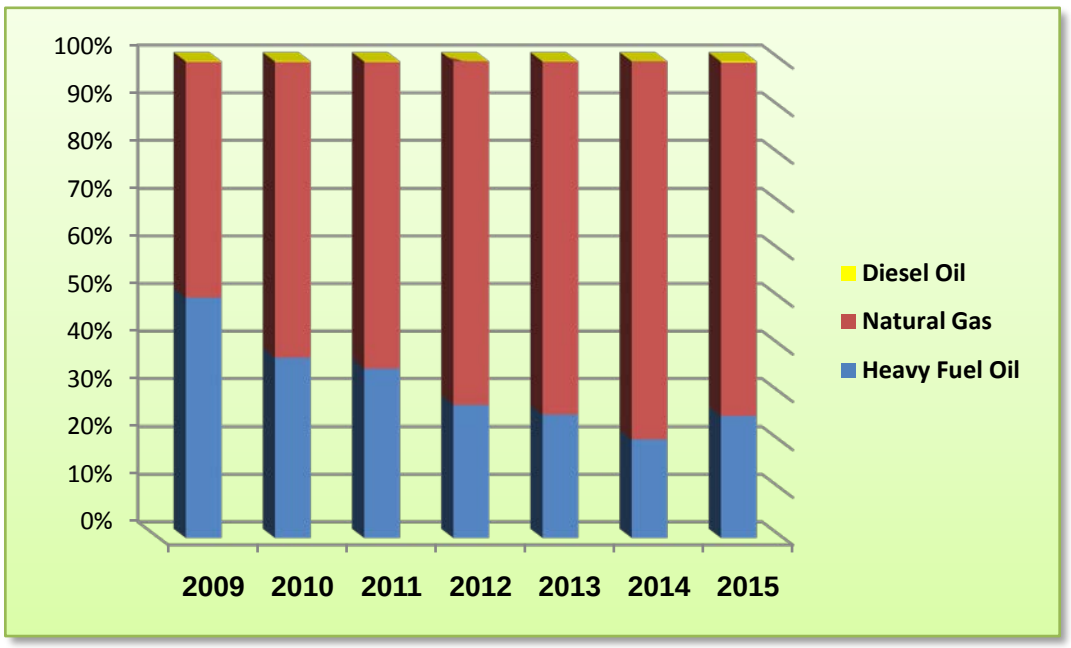
## *Total Fuel Consumption In Generation Stations*

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|
| Heavy Fuel Oil Consumption ($10^3$ TON) | 4882 | 3809 | 3768 | 2515 | 1601 | 1075 | 1208 |
| Natural Gas Consumption ($10^3$ $M^3$) | 5109 | 6670 | 7282 | 7029 | 5225 | 4664 | 3995 |
| Diesel Oil Consumption ($10^3$ Ton) | 9 | 13 | 12 | 6.7 | 3.9 | 10.5 | 11 |

## *Total Fuel Consumption In Generation Stations (K.T.O.E)*

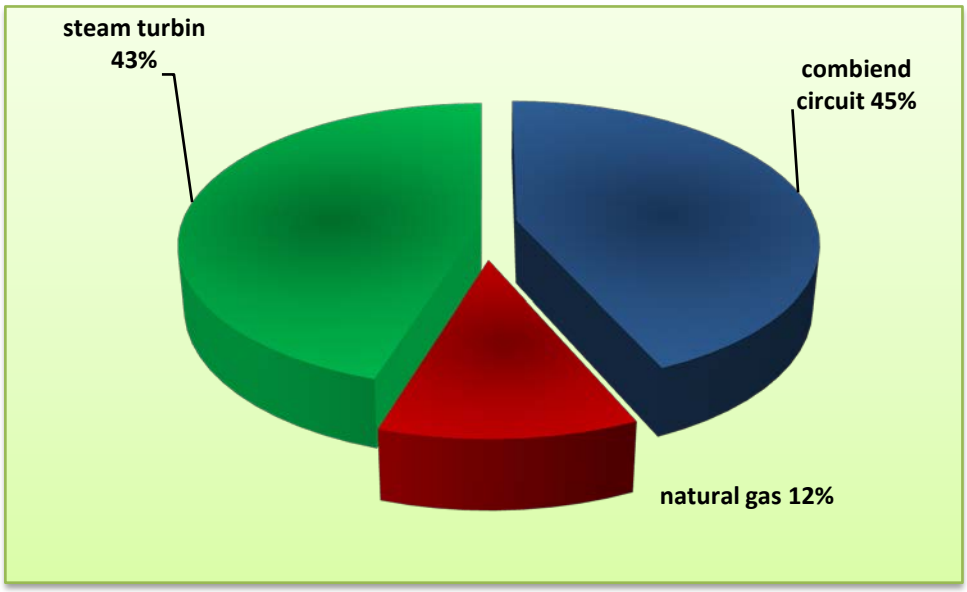
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Heavy Fuel Oil Consumption | 4687 | 3657 | 3617 | 2414 | 1520 | 1024 | 1157 |
| Natural Gas Consumption | 4597 | 6003 | 6563 | 6255 | 4364 | 3915 | 3367 |
| Diesel Oil Consumption | 9 | 13 | 12 | 6.9 | 4 | 10.7 | 11.2 |
| Total Fuel Consumption | 9239 | 9673 | 10192 | 8675.9 | 58888 | 4941 | 4535 |

## Fuel Consumption Development



## *Gross & Net Supply And Auxiliary Consumption For Power Generation Station*

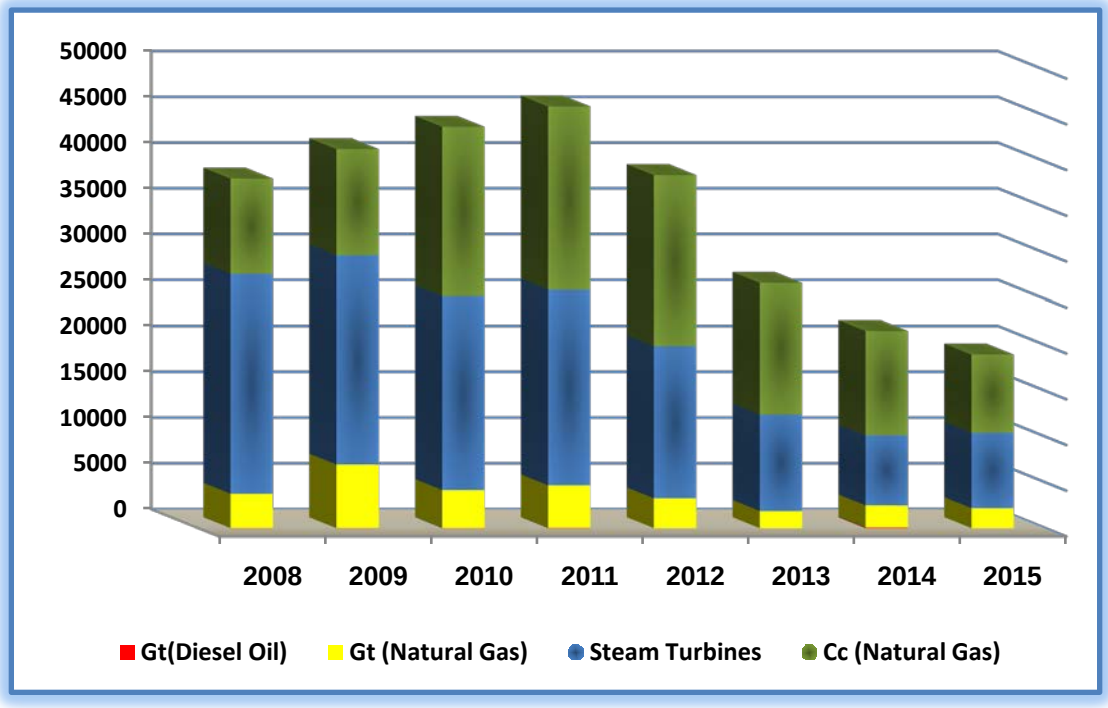
| | 2014 | | | 2015 | | |
|---|---|---|---|---|---|---|
| | Gross | Auxiliary | Net | Gross | Auxiliary | Net |
| 1-Steam Turbines | 7653 | 534 | 7119 | 8233 | 641 | 7592 |
| Mehardeh | 994 | 69 | 925 | 923 | 88 | 835 |
| Banias | 1963 | 138 | 1825 | 1524 | 105 | 1419 |
| Tishreen Thermal | 928 | 85 | 843 | 1633 | 164 | 1499 |
| Aleppo | 76 | 8 | 68 | 500 | 43 | 457 |
| Al Zara | 3692 | 231 | 3462 | 3623 | 241 | 3382 |
| Koutenah | 0 | 2.6 | -2.6 | 0 | 0 | 0 |
| 2-2 Natural Gas | 2426 | 45 | 2380 | 2185 | 42.2 | 2142.8 |
| Swedieh | 619 | 33 | 586 | 695 | 30 | 665 |
| Tayem | 74 | 0.7 | 73 | 19.2 | 0.2 | 19 |
| Tishreen Gas | 371 | 3 | 368 | 4.8 | 2 | 2.8 |
| Banias Extension | 1362 | 9 | 1352 | 1466 | 10 | 1456 |
| 3- Combined Circuit | 11403 | 242 | 11160 | 8558 | 226 | 8332 |
| Jandar | 3971 | 96 | 3875 | 4297 | 108 | 4189 |
| Jandar Extension | 1239 | 30 | 1209 | 1060 | 21 | 1039 |
| Nasrieh | 1657 | 28 | 1628 | 77 | 3 | 74 |
| Zezoun | 2117 | 50 | 2067 | 353 | 22 | 331 |
| Deir Ali | 1420 | 25 | 1395 | 1272 | 39 | 1233 |
| Tishren Extension | 849 | 8 | 135 | 1381 | 18 | 1363 |
| Dir Ali Extention | 150 | 5 | 145 | 118 | 15 | 103 |
| Grand Total | 21482 | 818 | 20659 | 18976 | 909.2 | 18066.8 |



# Total Production for Electricity Power Plants during 2009-2015

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|
| Gt(Diesel Oil) | 5 | 17 | 23 | 0 | 0 | 0 | 0 |
| Gt (Natural Gas) | 6946 | 4146 | 4183 | 3262 | 1873 | 2426 | 2185 |
| Steam Turbines | 22833 | 21153 | 20979 | 16621 | 10546 | 7654 | 8233 |
| Cc (Natural Gas) | 11599 | 18493 | 17273 | 18651 | 14345 | 11402 | 8558 |
| Total EnergyProduction | 41383 | 43809 | 42458 | 38534 | 26764 | 21482 | 18976 |

## Total Production For Electricity Power Plants during 2009 - 2015



# ***Generation Stations Projects***

## 1 - UnderExecutionProjects

1-1 Deir Ali Generation Station ExtensionProject with a combined circuit 750 M.Watt.
1-2 Deiral-Zour Generation Station Construction Project with a combined circuit 750M.watt
1-3 TishreenSteam Generation Station Extensionwithtwo sets 2 x 200 M. Watt.
1-4 Jandar Generation Station ExtensionProject with a combined circuit 450 M. Watt.

## 3 - Under Advertisement Projects

2-1 Al Zara Generation Station Extension with two steams sets / 2 x 250/ M. Watt.
2-2 Generation Station Project in the coastal area with a combined circuit and a capacity 350 M.Watt.
2-3 Portable Gas Turbines /10/ with a total capacity /250/M.Watt .
2-4 The Second Extension Project for Jandar Generation Power Plant with a combined circuit /350/M.Watt.
2-5 The Two Steam Sets Replacement Project in Banias .

## 5-Renewed energy projects

1- Execution of electro solar generation station project with a capacity /5/m.watt in DierAttyyah.

2- Execution of wind generation station project with capacity 50m.watt in Daraa –ghabaghb.

3- Execution of electro solar generation station project with capacity/1000/m.watt .

4- Execution of electro solar generation station project with capacity/ 5/m.watt in Jandar.

5- Execution of wind generation station project with capacity / 50/ m.watt in Kattenah .

# Training In Public Establishment For Electricity Generation

The massive expansive in the electricity sector in Syria, which is supplied with a new technology every day, specially electrical power generation sector this expansive impose upon the workers to upgrade their scientific level to accompany this expansive and development.

Public Establishment for electricity generation works within the program of the government to prepare and execute the five-year and annual plans to achieve the following goals:

1 - Operation of the electrical generating sets in the companies and public foundations economically and improving their yield returns by means of reducing the specific consumption and auxiliary consumption, in addition to raise the efficiency of their workers.

2 – Constructing an information system depends on the modern systems of the electronic computers in the financial, administrative and technical fields (Maintenance Management Programs).

3 - Raising the efficiency of the administrative organization and workers by holding training courses to prepare the staff of the establishment and increasing the efficiency to improve performance.

The development of the administrative financial and technical works system in the establishment and the implementation of the periodical and safety maintenance programs and upgrading the technical staff by continued external training at all levels, led to raise the reliability of the generating sets works.

Because of the need to preserve the efficiency of the workers in the establishments and its directorates and the need to train the new workers,the data processing and training directorate worked to train the workers by these following ways:

1 - Training at working sites through preparing training plan for the technical worker for a period between 3-12 months and under the supervision of the training staff at work sites.

2 - Training at Gander training center to learn dealing with all the similar equipment in the companies and foundations including operating, investment and maintenance of generation stations.

3 - External training: Technical factors are trained out of Syria through the signed contracts entered by the institution for operation, investment and maintenance of generation stations.

4 – Internal training: Technical factors are trained inside the power plant during the security period by the manufacturer experts and to ensure power plants contracts on failures that may face power plants.

# JandarTrainingCenter

It is one of the subordinate training center for the Ministry Of Electricity,Public Establishment For Electricity Generation .This center was constructed by a grant from the Japanese government.

• The center was opened in October 1998

• The geographical sites: It is located to the north of Syria far from it(130) km and to the south of Homs far from it (30) km.

• The intention of the center: Upgrading the ability of the engineers and increasing the skill of the worked technicians in the operation and maintenance field for generation sets through organizing training courses in these fields:

- New employed assigned engineers and technician course.
- generating of operation.
- Mechanic.
- Spoiling tests and solders techniques.
- Electricity
- Controlling
- Chemistry
- Data processing

The centre also works to train factors from out of the Public Establishment of Electricity Generation and Transmission.

For example: elements from the Ministry of Oil and its secondary companies, in addition to organize courses for the Arab Union States for producers, distributors and transporters of electricity.

# Mehardeh Generating Public Company

-Mehardeh Generating Public Company was constructed on the banks of Mehardeh-Dam Lake,on Al-Aassi River in Hama . This lake can store almost (67) million cubic meter of water and provide the generation power plant with cooling water.
-Mehardeh Generating Public Company consists of :
4 steam generation sets with capacity 150*2 and 165*2 m.watt in addition to a gas turbine for urgent uses with capacity (30)m.watt .So, the total nominal energy for the company is( 660) m.watt .
-The first and second sets started work in 1979 and the third and fourth sets in 1988.
-The working of boilers turned into gas in 1991 and gas pressure measuring and decrasing station have been constructed to provide boilers with gas . So, fuel and gas can be used at the same time . the purpose of using gas is to get pure burning and clean environment .
-48 flats was built in 1999 in addition to 30 flats by the engineers and workers of the company since 1980 and 80 flats in 2004 .

-Some indicators about Mehardeh Public Company:

| | 2013 | 2014 | 2015 |
|---|---|---|---|
| **Total Production of Electrical Energy (Millar. K. O)** | 1898110 | 994380 | 923792 |
| **Gas Consumption ( 1000 M3)** | 0 | 222000 | 182618 |
| **DiezelConsumption (tons)** | 507710 | 270083 | 102102 |

The number of workers in this company in 2015 is ( 538) , (410) of them are technicians (an engineer – an assistant engineer and a professional) all of them do all the required works to stay the company in service.